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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,209	06/03/2002	Malcolm Trayton Austen	722-X02-020	1825
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Martin Fleit		EXAMINER		
Fleit Kain Gibbons Gutman & Bongini		OLSEN, KAJ K		
520 Brickell Key Drive		ART UNIT		
Miami, FL 33131-2660		PAPER NUMBER		
		1753		
DATE MAILED: 11/30/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,209

Applicant(s)

AUSTEN ET AL.

Examiner

Kaj K Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 and 31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 and 31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 7 and 9 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.
3. Claim 7 is drawn to introducing conductive material via an (the?) electrode. The examiner cannot find support for this claim in the specification. What does it means to introduce the conductive material via the electrode and how is this supported by the specification?
4. In claim 9, it is unclear where this limitation is supported by the specification. In particular, the examiner cannot determine what this claim is actually claiming. What does it means to introduce material into "a substrate via the substrate". This would appear to be nonsensical. If the substrate already has the material then the substrate cannot introduce it to itself. Clarification is requested as to how this claim is meant to be interpreted and how that interpretation is supported by the specification.
5. Claims 1-29 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 would appear to be incomplete. In particular, it is drawn to a method of manufacturing a gas sensor where the steps of the claim are only drawn to the process of establishing an electrical pathway.
7. In claims 6-10, it is unclear if the "introduced" is the same thing as the impregnation of claim 1. If so, then applicant should consistently utilize the same terminology throughout the claims.
8. In claims 6-17, it is unclear if the substrate specified is the same thing as the membrane of claim 1. If so, then applicant should consistently utilize the same terminology throughout the claims.
9. In claim 7, it is unclear if the "an electrode" is the same or different electrode of claim 1.
10. In claim 8, it is entirely unclear what applicant is referring to with "an external connection". Is this the same thing as the "electrical contact" of claim 1? Claims 11-13 similarly utilize this confusing term.
11. Claim 9 is also indefinite for the reasons set forth in the enablement rejection above.
12. In claim 10, it would appear that a --the-- or --said-- should preface the "conductive material" to indicate it is referring back to the conductive material of claim 1.
13. In claim 11, it is unclear how "sintering" can be construed as being a means for forming an electrode. Sintering is merely a means for firing something and doesn't constitute a forming means by itself.
14. Claims 11 and 17 do not utilize appropriate Markush language for setting forth different species.
15. In claims 12 and 13, there is no antecedent basis for "electrodes".

16. In claim 13, the use of the term “external connection” is further confusing. In particular, if the examiner presumes that the “external connection” is the same thing as the “electrical contact” of claim 1, then it is unclear how claim 13 can depend from claim 1 when claim 1 required the electrical contact to be on the opposite side of the membrane (substrate?) from the electrode. How can the applicant now claim that the connection (contact?) is now on the same side of the membrane (substrate?) as the electrode when that violates a requirement of claim 1? Clarification is requested.

17. In claim 18, applicant utilizes the terms “planar substrate”, “substrate” and “the membrane” which all appear to refer to the same claimed device. Applicant should utilize consistent claim language. For the purpose of examination, the examiner will interpret all instances of “substrate” in this and in the earlier claims as being the same thing as the claimed membrane of claims 1 and 18, but clarification is requested.

18. In claim 18, presumably the “external electrical contact” and “electrical contact” are also referring to the same claimed material. If so, then applicant should consistently utilize the same terminology throughout the claims.

19. In claim 18, applicant claims first and second electrodes. However, later in the claim applicant refers to “an electrode” or “the electrode”. Is applicant referring to one of the previous cited electrodes (if so which one?) or is applicant defining an additional electrode? Clarification is requested.

20. In claim 18, it is unclear how to interpret “a portion of the electrode...is impregnated with conductive material”. In particular, an electrode is inherently a conductive material already.

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Is applicant specifying that the electrode has to be partially impregnated with conductive material other than its electrode material? Clarification is requested.

21. In claim 19, it is unclear which electrodes “the electrodes” is referring back to.

In claim 19, it would appear that the “external connections” should be --electrical contact-- or --external electrical contact-- because the previous recitation of “external... connection” in claim 18 was merely describing what the electrical contact provides and wasn’t a structural element per se of the invention. This claim is further confusing because there is no antecedent basis for the plural connections (or contacts).

22. In claims 22 and 23, it is unclear if these electrodes are either of the electrodes of claim 18 or are they further recited electrodes.

23. In claims 24 and 25, it would appear that “conductive mass” should be --conductive material--.

24. In claims 24 and 29, it would appear that the “polymer electrolyte” should --conductive polymer--. Electrolyte and conductive material do not have the same scope and applicant only sets forth the use of a conductive polymer in the specification.

25. In claims 25-27, the use of “the electrodes”, “external connections” or “external connection” are indefinite for the same reasons set forth for claim 19.

26. In claim 29, the “polymer electrolyte” is presumably referring to the “conductive material” of claim 18, but the claims never specifies that the conductive material further comprises a “polymer electrolyte”. See also the objection to the use of “polymer electrolyte” earlier.

27. In claim 31, applicant specifies that the membrane is "impervious to liquid" and has "liquid impermeability". If this is the case, then how can the melted conductive material emerge through the membrane? If the membrane is liquid impermeable, then it should also be impermeable to melted conductive material. Clarification is requested.

Claim Rejections - 35 USC § 102

28. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

29. Claims 1, 7-9, 12, 13, 18-23 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Matthiessen (USP 5,314,605).

30. With respect to claim 1, Matthiessen discloses a method of manufacturing a gas sensor comprising the use of a ceramic disc 2. Said ceramic disc has a permeable region 50 as well as holes through the discs at various points (see reference numbers 14 in the figure). Hence the ceramic disc of Matthiessen would constitute a membrane giving the claim language its broadest reasonable interpretation. Matthiessen teaches having conductive material being impregnated in the holes of the membrane to define an electrical contact on a first surface of the membrane and an electrode (9, 12 or 13) on a second surface of the membrane. See the figure and col. 5, lines 11-26. Matthiessen further teaches arranging the membrane 2 in conjunction with housing 1 such that a reservoir 17 is sealed. See the figure and col. 5, lines 27-38.

31. With respect to claims 7 and 8, because the electrode and electrical contacts of Matthiessen are continuous with where the conductive material is to impregnate (see the figure), regardless of how Matthiessen deposited the material that became the electrodes, conductive material and electrical contacts, this would appear to meet this vague limitation (see 112 rejection above).

32. With respect to claim 9, it would appear that any conductive material that has to go through the membrane to impregnate the membrane would meet this nonsensical limitation (see 112 rejection above).

33. With respect to claim 12, the electrodes are opposite the electrical connections. With respect to claim 13, it doesn't appear that this claim can be considered to further limit claim 1 since it appears to require structure in violation of the requirements of claim 1 (see 112 rejection above). Absent clarification as to how to interpret claim 13 as it depends from claim 1, this claim will be interpreted as being anticipated by Matthiessen because Matthiessen anticipated claim 1 (see above).

34. With respect to claim 18, Matthiessen teaches a gas sensor comprising a membrane 2, a housing 1 containing a reservoir for liquid electrolyte, first and second electrodes (any two of 9, 12, or 13) and an electrical contact 14 for making an external electrical connection. See the figure and col. 5, lines 11-26. Matthiessen further teaches conductive material between the electrical contact and the electrodes that is impregnated in the membrane. See the figure and the previous discussion. Said material is forming an electrical pathway for the electrical contact and the electrode.

35. With respect to claim 19, because the electrode(s) are for electrochemically detecting a gas sample (see the abstract), the measuring electrode must be inherently catalytic (and hence contain catalytic material) if it is capable of reacting with the gas.

36. With respect to claims 20-23, Matthiessen teaches the presence of three electrodes which would read on the claimed electrodes. With respect to the various claimed functions of the electrodes, those are either already taught by Matthiessen or constitute the intended use of the electrodes. The intended use of a structural element need not be given further due consideration in determining patentability.

37. With respect to claim 27, the external connection of Matthiessen would read on the claimed metal strip 14.

Claim Rejections - 35 USC § 103

38. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

39. Claims 2-5, 24-26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matthiessen in view of WO 99/24826.

40. With respect to claims 2-5 and 28, Matthiessen set forth all the limitations of the claim, but did not explicitly recite the presence of a wick to the electrode. WO '826 teaches the presence of a wick material 54 in order to provide an electrode with better access to the electrolyte. See p. 21, lines 15-18. It would have been obvious to one of ordinary skill in the art

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at the time the invention was being made to utilize the teaching of WO '826 for the method or sensor of Matthiessen in order to provide an electrode with better access to electrolyte.

41. With respect to the sintering temperature, see WO '826 p. 8. lines 7-10.

42. With respect to claims 24 and 26, WO '826 also discloses the use of conductive polymers for providing good electrical connections. See p. 21, lines 1-9. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize this teaching of WO '826 for the sensor of Matthiessen in order to provide good electrical connections for the electrodes.

43. With respect to claim 25, the conductive material of Matthiessen would constitute a plug giving the claim language its broadest reasonable interpretation.

44. Claims 2-5 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matthiessen in view of Cromer (USP 4,322,278).

45. Matthiessen set forth all the limitations of the claims, but did not explicitly recite the presence of a wick to the electrode. Cromer also discloses the presence of a wick in order to improve an electrodes access to the electrolyte. See abstract. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teachings of either WO '826 or Cromer for the method or sensor of Matthiessen in order to provide an electrode with better access to electrolyte.

46. With respect to the explicit sintering temperatures, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the set forth temperatures because finding the suitable temperature for sintering a wick requires only routine skill in the art.

47. Claims 10, 11 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matthiessen in view of Tomantschger et al (USP 5,173,166).

48. With respect to claims 10, 24 and 26, Matthiessen set forth all the limitations of the claims, but did not explicitly recite introducing the conductive material in melted form (claim 10) or the use of conductive polymers (claims 24 and 26). Tomantschger teaches in an alternate gas sensor that the electrical connections can be established using a conductive polymer and the conductive polymer may be melted to establish a better electrical connection between the electrodes and the leads. See col. 4, lines 54-61 and col. 10, lines 26-32. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Tomantschger for the method of Matthiessen in order to establish a better electrical connection to the electrodes.

49. With respect to claim 11, Matthiessen teaches all the limitations of the claim, but did not explicitly recite forming the electrodes or connectors via any of the set forth methods. However, the use of spray coating and screen printing are notoriously old means for forming electrodes. In particular, this is demonstrated by Tomantschger. See col. 11, lines 43-49. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Tomantschger for the method of Matthiessen because the substitution of one known means for preparing electrodes for another known means requires only routine skill in the art.

50. With respect to claim 25, the conductive material of Matthiessen would constitute a plug giving the claim language its broadest reasonable interpretation.

51. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matthiessen in view of Dodgson et al (USP 5,914,019).

52. Matthiessen set forth all the limitations of the claims, but did not explicitly recite the claimed means for bonding the housing and the membrane. Dodgson teaches in an alternate gas sensor that both are known means for sealing up a gas sensor. See col. 3, lines 57-65 and col. 5, lines 35-50. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Dodgson for the method of Matthiessen in order to ensure the sensor possesses a suitable seal for the electrolyte reservoir to prevent leakage.
53. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matthiessen in view of Tantram et al (USP 4,132,616).
54. The references set forth all the limitations of the claim, but did not explicitly recite the step of decreasing the permeability of the membrane. However, the step of selectively reducing a membrane's permeability is well known in the art. In particular, Tantram teaches doing so in an alternate gas sensor in order to tailor its diffusion properties. See col. 4, lines 5-10. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Tantram for the gas sensor of Matthiessen in order to precisely control the porosity of the membrane.

Allowable Subject Matter

55. Claims 6 and 29 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

56. Claim 31 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

57. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 6 and 29, the prior art does not disclose nor render obvious all the limitations of the claims 2 or 28 respectively and further comprising either introducing the conductive material via the wick or the presence of a wick having aperture through which a conductive polymer could be introduced. With respect to claim 31, the prior art does not teach nor render obvious all the cumulative limitations of the claim with particular attention to the controlling of heat and pressure to urge the conductive material through the pores of the membrane until the conductive material emerges from the second surface.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Thursday from 5:30 A.M. to 3:00 P.M. and on alternate Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753
November 26, 2004



KAJ K. OLSEN
PRIMARY EXAMINER